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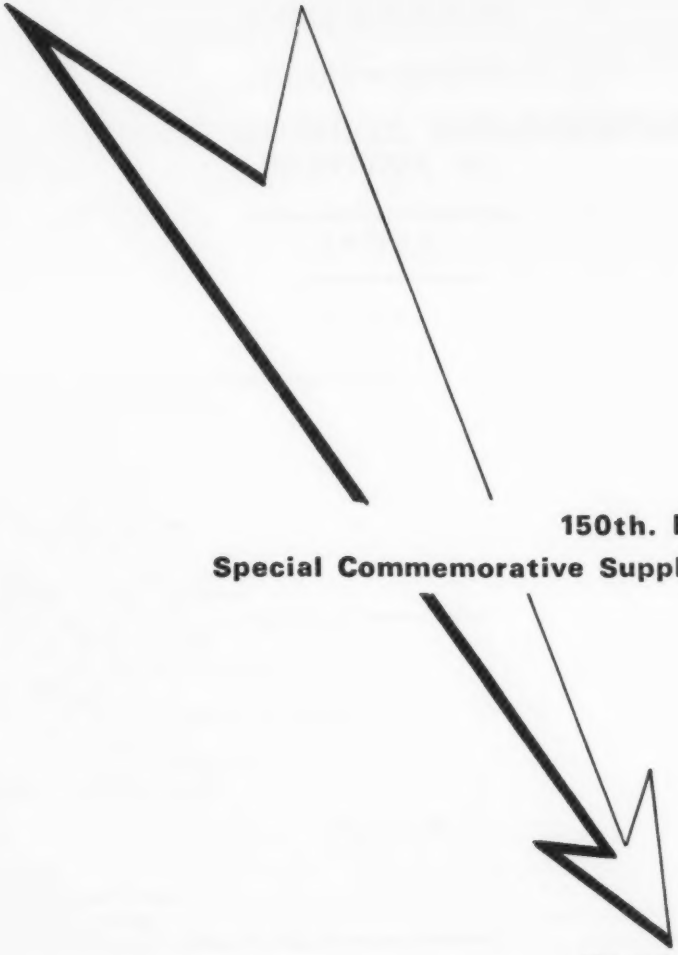

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REPORT

OF THE

COMMITTEE

APPOINTED TO INQUIRE INTO

COPYING MACHINES, DEPARTMENTAL PRINTING, &c.

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* Original page numbers have been changed; and the Appendix omitted.—*Editor.*

CONFIDENTIAL.

Report of the Committee appointed to inquire into Copying Machines, Departmental Printing, &c.

May it please your Lordships.

WE have the honour to lay before your Lordships the result of the inquiries which we have made pursuant to the instructions of the Treasury Minute of the 22nd January, 1877.

Our Report will be divided under two general headings, viz.:—

Headings of Report.

I. That of *mechanical contrivances invented for economising the labour of writing by hand, and of copying generally.*

II. That of *printing.*

I.

We have visited all the chief public Departments in London, and have conferred with the principal officers of those Departments respecting the questions referred to us. With a view of ascertaining what is the nature and amount of work which can properly be called copying, we addressed a Circular to most of the large offices, a copy of which, with an abstract of the replies received to it, will be found in the Appendix.

Copying requirements of public Departments.

The work of copying is managed in a variety of ways in the different Departments; but there is, as might be expected, a considerable similarity in the leading requirements of public offices, so far as plain manual labour is concerned.

(*a.*) There is the work of writing out from draft a fair copy for despatch.

(*b.*) Keeping an authentic record of it.

(*c.*) Making copies for inclosure in other letters.

(*d.*) Multiplying letters or documents required to be issued in numbers not sufficient to make it worth while to resort to printing.

It is only recently that there have been developed into any practical shape contrivances for executing the work under headings (*a*) and (*d*); but for economising the manual work under headings (*b*) and, to some extent, (*c*), there has existed for a long time the common expedient of having recourse to the use of tissue paper and a copying press.

The ordinary Copying Press.

The adoption of this expedient generally in public offices, more especially as regards (*b*), has been from time to time strongly advocated as a means of effecting a substantial saving in clerical force.* In some offices the expedient works fairly well; in others, the results produced are not satisfactory. In some cases it has been tried and abandoned: while in several Departments the process has been thought too little suited to the requirements of the public service to be introduced.

Objections to it.

There are several objections to this process:

(*a.*) The impression or impressions taken from the original have

* *e.g.* In the Third Report of the Select Committee on Civil Service Expenditure (Parliamentary Paper No. 352, Sess. 1873), and in the First Report of the Civil Service Inquiry Commission (Parliamentary Paper No. C. 1113, Sess. 1875).

hitherto been on very thin and frail paper, which does not invariably answer for official record and frequent reference.

(*b.*) The paper can only be used on one side.

(*c.*) Both the original and impression are likely to become disfigured, unless there is very careful handling.

(*d.*) The copy on the tissue paper does not last as long as ordinary manuscript writing, but after a lapse of time is more liable to fade.

The invention of other and superior processes.

Of late several processes have been invented, as your Lordships are aware, which purport not only to counteract these objections to the ordinary press-copying, but also to compete with printing as well as lithography in producing impressions, and even to serve as a direct substitute for penmanship.

How far these objects have been satisfactorily attained, and how far such contrivances may be usefully applied in public Departments, it has been our duty to consider and report.

We shall first briefly describe the various processes which have been brought under our notice.

i.—*Zuccato's Patent Papyrograph.*

The Papyrograph described.

The writing to be multiplied by this process—(to use the words of the Patentees),—" must be executed upon a sheet of *special* waterproof paper, with the papyrographic ink. This ink, without injuring the fibres of the paper, attacks or corrodes the waterproofing where lines or other delineations are formed. The corroded lines, and the ink with which they have been written, are dissolved by water, and removed by means of a wet brush, the manuscript thus becoming a porous stencil held together by the fibres of the paper. This stencil is laid " (painted side downwards) " upon a velvet pad impregnated with a colour, which, upon being submitted to pressure, is forced through the lines of the stencil, producing a perfect facsimile of the writing or drawing upon any paper with which it is brought in contact. A like result is attained as often as a new sheet of paper is laid upon the stencil and submitted to pressure."

Any ordinary copying press is used; and, exclusive of the expense of the press, a fair supply of the different materials, such as are required for adapting the process to foolscap-sized paper, is to be obtained in a cabinet chest at the cost of 10*l.*, including the licence to use the patent.

ii.—*The Edison Electrical Pen.*

The Electric Pen described.

This invention, which is of American origin, consists of a small electro-magnetic engine, mounted upon a frame-work secured to the top of a metal tube. Within the tube is a fine pointed needle fastened to the end of a wire, to which is given an exceedingly rapid vertical motion by means of the rotating engine shaft. This needle is projected from the small end of the tube at the rate of about fifty times per second. The pen is held in the hand in an upright position, and on its being written with upon a sheet of ordinary writing paper placed on some soft substance, such as a pad of blotting paper, the characters are formed by an infinite number of fine holes pierced in the paper by the rapid projection

of the needle from the tube. Such is the rapidity of the motion of the needle that the paper is neither dragged nor torn. The paper so punctured forms the stencil or *matrix*. The stencil or *matrix* is then laid in a specially contrived frame upon the paper, on which the copy is to be produced; and on its being secured in position, a roller formed of felt, upon which is put ordinary printer's ink, thinned with an oil and well distributed over its surface, is passed backwards and forwards a few times over the stencil. The ink is thereby forced through the small holes and becomes deposited upon the paper underneath. The result is a facsimile of the original writing; and the process can be repeated for several hundred times.

The pen and the different appliances, including the battery and the press, are to be obtained for 8*l*. 8*s*.

The copies taken off the stencil have very much the appearance of lithographed matter.

iii.—"*Fellows*' " *Process*.

The Fellows' process described.

Your Lordships are already partially acquainted with this process. The inventor, in consideration of a payment of 300*l*. in 1875, and a contingent promise of 200*l*. in addition, made to him by your Lordships, agreed not to patent it.

The working of it is as follows:—

The original document of which a copy or copies may be required is written with specially prepared ink on ordinary paper. After the ink has been allowed to dry, the original is laid face downwards on a specially prepared amber-coloured flimsy,* which has been previously well damped by a hairbrush and placed on a common oiled sheet, such as is used in taking ordinary copies. It is then put between two boards and given a squeeze in the press. An impression is thereupon instantaneously made on the flimsy, which becomes the *matrix* from which copies are reproduced. The flimsy is then removed from the oiled sheet on to a well-damped pad of blotting-paper;† and on the side of the *matrix*, which received the ink from the original, is laid a sheet of ordinary dry paper. A board or oiled sheet having been placed on the top of the paper, the whole (pad, paper, and board) is then placed in the press together, and left there for rather less than half-a-minute. After this, the sheet on which the impression has been produced is removed, and another placed on the flimsy; and so on, until the required number of copies is obtained, or the ink upon the flimsy exhausted. After about six copies have been obtained, each successive sheet should remain in the press for a slightly longer time than the one which preceded it. If more copies of the original are wanted than what the first flimsy will throw off, a second, third, or fourth flimsy can be taken. In this case, the amount of pressure applied to the first flimsy should not be too great,

* It is found by experience that, in taking a transfer, it is better to use *two* flimsies, because, if only one be used, the oiled sheet on which it is placed, and which is more costly than a flimsy, is apt to be spoiled by the ink going through on to it.

† A thick *bound* pad of blotting-paper is found to answer best.

in order that too much ink may not be taken off the original, but a reserve be left for the fresh flimsy or flimsies.

Both sides of the paper, on which the copy is taken, can be made use of, provided the paper be of a moderately stout texture. Unglazed paper appears to be preferable.

We have had Fellows' best blue ink analysed, and we find that it is composed of "an aniline colour in an acetic acid solution," and that "there is also present a small quantity of iron, which acts as a mordant or fixing agent."

We further find that parchment takes the Fellows' ink very well, and does not become shrivelled up by the damping.

iv.—"*Byford's*" *Facsimile Printing Process.*

The Byford process described.

This process, for which Mr. A. T. Byford took out a patent, and Messrs. Straker and Sons (of 124, Fenchurch Street) are agents, bears a strong resemblance to the *Fellows' process*, both in its results and in the manner of working it.

The original document required to be reproduced is written on ordinary writing-paper with the pen well charged with a specially prepared ink, which likewise consists of "an aniline colour containing a small quantity of iron salt as a fixing agent." A sheet of strong paper, known in the trade as "plate paper," after being thoroughly damped with a brush, is placed inside a portfolio containing a prepared pad faced with cloth; and on the portfolio being closed it is pressed to insure uniform saturation of the paper, and to absorb any superfluous moisture. The original document is then laid on the "plate-paper," and on pressure being applied in the ordinary manner for about one minute, a transfer copy in reverse is obtained. This transfer copy serves as the *matrix*, from which the manifold copies are taken on any ordinary dry writing-paper, the preference being given to a white paper with a not too highly glazed surface. When the impressions are seen to become faint, the under side of the transfer has to be moistened with water; and when a larger number of copies is required than what the first flimsy will produce, a second transfer can be taken from the original document. As is the case with Fellows' process, *both* sides of the paper on to which the copy is taken can be used, if the paper be of a moderately stout texture. The entire apparatus, foolscap size, is to be obtained (exclusive of copying-press) for 1*l.* 15*s.*

v.—"*Lewthwaite's*" *Process.*

The Lewthwaite process described.

This process only differs from Byford's "*facsimile*" process in a few details. The ink is also composed of an aniline colour in a nearly neutral solution, but there is present a quantity of saccharine matter or mucilage. The transfer paper is of a like texture, only of a more spongy nature. The manipulation is exactly similar.

vi.—*The Type-Writer.*

The Type-Writer described.

This machine, like the electric pen, is of American origin, having been invented by Messrs. Remington and Sons; and in size and appear-

ance it somewhat resembles the other machine with which the names of those manufacturers is associated, viz., the sewing machine.

Writing with the *type-writer* consists of touching keys, which are grouped in four rows of eleven each. On each key is printed the letter, character, or number which it represents, arranged in the order which experience has found most conducive to handiness; and on any key being depressed the corresponding letter, character, or number in type form rises like the hammer of a note of the pianoforte, and strikes a ribbon, soaked in a specially prepared ink, through which it sends its impression on to the paper. The type of the machines is confined to capitals.

It is stated that "a paper *not* cream-laid is preferable, as with it the ink is not subjected to the chance of blurring, which a highly glazed paper sometimes occasions."

On a paper of this description of average thickness, both sides may be written on, without risk of the impression showing through on the wrong side. The cost of the machine is 21*l.*

These various processes and machines have all been exhibited to us by their respective inventors, or agents acting on their behalf.

Points in common of the first five processes.

It will be observed that the first five of the processes just described purport to attain the same end by more or less different means; and that they each have this much in common, viz.:—

(1.) They involve in the first instance the necessity of a manuscript document.

(2.) They provide a printing surface or *matrix* from which a varying number of copies may be taken.

They, therefore, fairly admit of comparison; and the preference should be given to the one that is found to be the most simple to work, the most legible in its results, the most cleanly, economical, and expeditious, and at the same time capable of producing a considerable number of copies on both sides of the paper.

The working of the papyrograph.

With regard to the *papyrograph*, the patentees of the invention claim the production of a proof impression within five minutes after a manuscript has been completed, and the multiplication, at the rate of seven or eight per minute, of as many as 500 copies from one sheet of papyrographic paper with a single application of colour.

The process has been taken into use (among other offices) at the Civil Service Commission and the Admiralty, and we have witnessed the ordinary working of it in both Departments.

We consider that in *practice* its powers of rapidity are somewhat overrated by the patentee. It is found that the stencil or *matrix* improves by being kept for an hour or so before impressions are struck off it, and that the ordinary rate of producing copies from it is about eighty per hour. As the chemical processes require nicety of management and manipulation, the utility of the apparatus in no small measure depends upon the skill of the operator, and a certain amount of training and experience is therefore needful.

In order to ensure a successful result, the pressure of the hand upon the pen should be uniform, and each stroke clearly defined.

The necessity of executing the writing, in the first instance, on a *special* paper, is, in our opinion, a considerable drawback to the practical

usefulness of this process, to say nothing of the original being made useless, and the ink destroying the paper wherever it marks.

The *papyrographic process* has no doubt great reproductive power; but, on the whole, it appears to us to be somewhat cumbersome and not very cleanly. The original cost, too, 10*l.*, should not be left out of consideration.

The working of the Electric Pen.

It is impossible not to be struck with the ingenuity of the *electric pen*, but we doubt whether it would be found to answer its purpose in daily practice.

The pen makes a disagreeable buzzing noise; and, owing to the even and considerable pressure on the paper required, the upright position in which the instrument has to be held, and the slowness with which it must necessarily be worked, the process of writing is awkward and irksome.

This invention, like the *papyrograph*, is capable of throwing off a large number of copies.

For the reasons given above, we do not recommend either of these processes for general adoption.

The other three processes compared.

The *Fellows*, *Byford*, and *Lewthwaite* processes, which much resemble each other, have been tested side by side in the copying department of the Board of Inland Revenue, under the superintendence of Mr. H. G. Deacon, who has bestowed much care and trouble in experimenting on these rival processes.

Objections common to each of them.

There are no doubt several objections common to all of them:—

1. The writing of the original document must be confined to one side of the paper only.

2. The ink is not so pleasant to write with as ordinary writing or copying ink, for the reason that

(*a.*) It is thicker, and

(*b.*) The pen requires more constant replenishment.

3. The handwriting must be tolerably even,—neither excessively thick nor excessively thin.

4. Erasures must be avoided.*

Fellows' process preferred;

But, apart from these objections, which appear to be unavoidable, we are of opinion that the advantage rests with the *Fellows' process.*

Because the manipulation is simplest.

1. *The manipulation of it is more simple than that of either the Byford or Lewthwaite process;* because all apparatus, like cases, prepared pads, plates, &c., can be dispensed with; and all that is necessary is a pad of ordinary blotting paper well damped.

It is the most expeditious and powerful;

2. *It is more expeditious and possesses greater powers of reproduction.*

As many as 200 copies may be taken off one original, all of which with a little care may be legible and sufficiently clear and dark for official purposes, viz.:—125 from the first flimsy; 50 from the second flimsy; 25 from the third flimsy.

The first seventy-two copies can be taken off in forty-five minutes; the remaining 128 copies not occupying more than two-and-a-half hours.

By the *Byford* process forty copies in two hours are producible from the first flimsy and twenty-eight from the second.

* There is a further objection to these processes in the opinion of some persons, which is that the ink is *blue*, and therefore trying to the eyes, but which we think somewhat fanciful.

The *Lewthwaite* process is still slower.

3. *The prepared ink when written with takes very little longer to dry than ordinary ink.*

The ink dries easily;

As the ink must not be blotted, this is of some importance when rapidity is an object.

4. *The prepared ink is less susceptible to the action of light and of chemical agents or solvents.*

It is probably the most enduring;

It has probably, therefore, the greatest powers of endurance.

5. *Its introduction will involve a hardly appreciable expense.*

It is inexpensive;

Patent rights having been excluded on certain terms guaranteed to the proprietor, the only further cost will consist in the payment of 200*l.*, and in supplies of the ink, oiled sheets, and the special flimsies.

6. *The process answers successfully in cases where parchment is used.*

It can be used with parchment;

We think, then, that the *Fellows' process* is a valuable acquisition.

It has been subjected to a trial of some months' duration at the General Post-office, and is found to answer the purposes for which it was introduced. In the Inland Revenue Department it has been likewise tried, and with considerable success.

It has answered in the Post-office, and Inland Revenue Department.

The only point on which we feel we cannot speak with certainty, and which can probably be only tested by time, is whether the ink will be found to be as durable as ordinary ink.

The only question is—Will it last?

Otherwise we have no doubt that the *Fellows' process* will satisfactorily meet the copying requirements of public departments, whenever more than one copy of a document is wanted for inclosure or some other purpose, and likewise when a document has to be considerably multiplied. In both cases there will be effected a saving of manual labour; and in the latter case, the necessity for resorting to printing will, we believe, be frequently obviated, whenever the subject matter is not sufficiently important to warrant the expense of being set up in type,—whenever expedition is of great object,—and whenever the document is of so specially confidential a nature as to make it undesirable that it should leave the office or even the hands of the writer. The process will also provide for the preparation of examination papers in foreign characters, for which it may be almost impossible to procure the necessary type, or in mathematics, and of other papers illustrated by drawings, the setting-up of which is necessarily attended with great expense, even when possible.

Suitable for the public service when more than one copy is wanted;

And in the case of examination papers.

For these purposes, then, we have no hesitation in recommending the adoption of the process in all public departments, which require copying of this description. We hope that, on its introduction, Departments may be able to effect some reduction in their copying staff. We think that the working of the process, in order to ensure its success, should be intrusted to one or two persons only, specially told off for the purpose, and not be left to be taken up indiscriminately by clerks in different branches of the same office; and that, as we are satisfied that only a little practice and ordinary intelligence is required to obtain a thorough acquaintance with the details of the device, the heads of Departments should insist upon the copies produced by the process being turned out in a thoroughly legible and cleanly form.

Its introduction into Public Departments accordingly recommended.

We are not equally certain whether it will be found in practice that, for the mere purpose of keeping an authentic record of every despatch

How far fit for taking one copy of letters outwards is more doubtful.

outwards, the *Fellows'* process will be found to be as handy and advantageous. In Departments, where the common copying on tissue paper has been found to answer satisfactorily for record, it may be preferable to make no change, unless it be to substitute for the tissue paper a new, though more expensive, paper, for which, under the name of *the "stout" (buff) Copying Paper, Patented*, Messrs. Partridge and Cooper, in Chancery Lane, are Agents.

And here we would remark that in those Departments where the task of taking press copies is assigned to one or two officers only, the result is entirely satisfactory as regards clearness and legibility. But failure is sure to result where this rule is not observed. We attribute the undoubted failure, which has occurred in more than one Government office, to the want of this precaution.

In Departments where tissue-paper copies are found unsuitable, and where yet it is most desirable to get rid of the labour of writing-up ordinary letter-books by hand, the letters could be written out fair for despatch by *Fellows'* prepared ink, only in a diluted solution (*i.e.*, five parts of water and one of ink), which is far less disagreeable to write with than the solution required for producing a number of copies, and yet is of sufficient strength to admit of the production of three or four copies.

But keeping the record of the letter despatched is so intimately connected with the preparation of the despatch itself, that our observations here in great measure depend upon how far it may be possible and desirable to introduce into public Departments the process, which purports to take the place of the pen in the first instance. We refer to the *Type-writer*.

For this purpose, however, there is likewise the Type-writer.

We consider that this machine has passed out of the experimental into the useful stage, although experience may be still wanting to bring out its full advantages.

The working of the machine is easily acquired by practice, as the manipulation of the 44 keys and the adjustment of the paper are readily learned. The rapidity of the execution, of course, entirely depends on the expertness and agility of the person fingering the keys. We have seen as many as 111 words written by a skilled female machinist in two minutes: and, as the machine was then worked under some disadvantages, this was by no means the greatest pace attainable. Setting aside, however, great expertness, we think that in ordinary practice the average speed of the *Type-writer* should be 45 words per minute; while the pen, in the hands of an ordinary copyist, will not be found to exceed from 20 to 25 words per minute at the most. In fact, it may be held that one good operator on the machine is equal to two expert penmen, while the wages of the former, if women or boys be employed, would not be more than two-thirds of the wages of one of the latter.

The working of this machine.

Its average speed.

The number of words which a page of "type-written" matter contains, of course, depends upon the space left between the lines, which can be adjusted at the option of the operator. But taking the average number of words written by the *Type-writer* on a page of foolscap paper, as compared with the average number of words written by a copyist on a page of the same sized paper, the proportion will, roughly speaking, be found to be as 200 to 100, or 2 to 1.

Its average work on a page.

The *Type-writer*, as we have shown, does not purport to be primarily an invention for multiplying copies, but satisfactory results of taking copies simultaneously with the original have been attained by means of carbonized paper. The number of repetitions which can be obtained depends on the thickness of the paper used; and from 4 to 14 copies, in proportion to the texture of the paper, have been produced.

Its multiplying powers.

We, however, have hopes that it will be found possible to use with the *Type-writer* an ink possessing the advantages of Fellows' or Byford's ink, thereby combining, with a great economy in the amount of paper used, not only greater rapidity in preparing the original document, but likewise providing a more powerful manifold process than is obtainable by means of carbonized paper.

Possible improvement of those powers indicated.

We further find that, for producing one impression, parchment is as susceptible to the action of the instrument as paper.

The machine does not appear liable to get out of working order, and the ribbon only requires to be re-inked at intervals of several weeks.

As your Lordships are already aware, the *Type-writer* has been for some time in use in several of the Public Departments, notably in the Post Office, the Board of Inland Revenue, and Board of Trade.

Result of its trial in Public Departments.

The machine has not in all cases answered to the expectations formed of it, when its introduction was asked to be sanctioned. The chief exceptions taken to it have been these, viz.:—

Exceptions taken to it.

(1.) The absolute accuracy required in the manipulation of the keys, in default of which it is necessary to erase any mistake by a penknife and insert the correction with a pen, or by a readjustment of the paper.

(2.) The difficulty which some persons say they experience in reading the type writing.

The first objection can only be met by care and expertness.

To the second objection we do not attach any importance. It arises, of course, from the machine writing in capital letters only. It may be well to mention here, that the reason for using capital letters only is, that capitals are all of nearly the same breadth, while in small type or in handwriting the breadth of the different letters varies so much, that they would not look equally spaced, if their centres were at equal distances. To set this right would be possible, but it would necessitate a keyboard of double the size, and it would greatly enhance the complication of the machinery.

It is probable, however, that with very little practice the eye would easily become accustomed to read the type; and though the type might never be as pleasant as ordinary print, yet it would soon be found to compare favourably with hand-writing, inasmuch as it is never illegible and always uniform.

On the whole we recommend the adoption of the *Type-writer* into public Departments. The machine, however, should not be placed in the hands of ordinary men copyists, who, not having received the special training to enable them to manipulate it with expertness, cannot be expected to use it with advantage.

Its adoption in offices, on the whole, recommended.

To whom the working of the machine should be entrusted.

In large Departments, where female labour may be utilized, we think it will be best to employ women on this work. For smaller Departments, Boy-Writers, properly trained to work the machine, should be engaged.

It will probably be prudent to introduce the machine gradually into

general use. A certain number might be bought and lent to Departments for trial over a fixed period, when, if desired, and on a reasonable saving being shown, they might be retained for permanent use.

Photo-lithography.

There is another process, witnessed by us, which we must not fail to notice, viz., *photo-lithography*. We mention it separately, as it is hardly applicable to ordinary copying.

Its uses.

Mr. Malby (photographer, of 37, Parker Street, W.C.), to whom we believe the invention is due, has the means of fixing on stone by certain chemical processes an exact *facsimile* of whatever is subjected to the camera. Where delicate work, such as specifications, drawings, &c., is wanted to be reproduced with great accuracy and minuteness, this process is a most valuable invention, and it has been used with great advantage in the Patent Office in reproducing specifications for patents which are most costly to engrave, and require perfection of likeness to the original.

It occurred to us that this process might likewise be of use, if applied to the reproduction of printed matter, in cases where the type has been broken up. But on calculating the cost and time, we found that the process offers no advantages over recomposition of the type in either of these respects.

Room for improvement in contrivances recommended.

In recommending the introduction of the *Fellows'* process and the *Type-Writer* into Public Departments, we wish it to be understood that we only consider them to be the best means *at present available* of reducing manual labour. We think that mechanical contrivances of this description are only as yet in their infancy, and are capable of further development and considerable improvement, which will no doubt take place before long.

Greater uniformity of practice advocated as regards copying.

We would accompany this recommendation by strongly advocating a greater uniformity of practice throughout the public service in the execution of copying work generally.

Concentration in one branch.

In prosecuting our inquiries, we have observed that, though in some Departments copying work is concentrated in one branch, yet in others it is spread over all the branches of the office, in which case established clerks, and not unfrequently those of the Upper Division, generally write out in fair hand for despatch the letters on subjects with which their particular branch or subdivision of the office has to deal.

This practice seems to us a great waste of power. We think that all letters intended for despatch should be drafted, whether from shorter minutes or not, in the first instance, in such form as to admit of all fair copying, as distinct from drafting, being done by ordinary copyists, and that for this purpose it is essential, whenever the copying work of a Department is at all large in amount, that there should be one copying branch in a Department. This concentration is an important step in the division of labour, which, in the interests of economy and efficiency, we consider it most desirable to extend as far as possible in the public service; and it is further obvious that such concentration is a necessary preliminary to the successful introduction of mechanical appliances for economizing manual labour.

The practice we advocate has not only the advantage of saving the time of a more highly-paid officer, who, of course, drafts faster than he can fair-copy, but it likewise ensures the presence with each paper of a

full copy of the answer made upon it, and so supersedes in all ordinary cases the necessity of sending for the Letter Books containing the copies of record.*

Payment by piecework.

There is one other point in connection with this subject to which we desire to call attention. The question of paying copyists by piecework instead of by time has, as we are aware, often been advocated, on the ground that it is economical to the public, as well as advantageous to the expert workman. A reference, however, to the answers we have obtained from the different Departments will show that payment by time is still the common practice. We take leave to suggest that the heads of public Departments should be urged to adopt to a much greater extent the plan of payment by piecework. There may be instances where such a system may not be practicable, but we feel convinced that, as a rule, it will be found feasible, and that a considerable saving may thereby be effected.

We would further point out that the plan of paying by the piece should be applied to the work done by the *Type-Writer*, and to the writing of the original by the *Fellows' Process*, as well as to the striking off of copies from it.

Another possible method of saving copying.

In speaking generally of the copying in public Departments, we think that the conduct of business would in some cases admit of an extension of the system, which has in practice been found to answer satisfactorily at the Foreign Office, and which is strongly advocated by Lord Tenterden, of sending papers in original from one office to another instead of transmitting copies as inclosures. Inconvenience will no doubt arise, if great discretion be not exercised in resorting to this system; but there are cases in which recourse may be had to it without detriment to the transaction of public business, as, for instance, when papers are transmitted " for information " only; and it is manifest that any adoption of this system will necessarily reduce the amount of copying in a Department.

Recapitulation.

To sum up briefly the foregoing recommendations, we advocate—

1. The introduction into public Departments of—
   a. The *Fellows' Process*.
   b. The *Type-Writer*.

2. The concentration of all the copying work of a Department, whether by hand or by mechanical contrivances, in one branch under a responsible head.

3. The payment for copying both by hand and by means of mechanical appliances, whenever practicable, by the piece.

Alissoff's Mechanical Printer.

Before passing on to the second heading of our Report, we wish to refer to one other invention, which may be said to occupy a kind of intermediate position between copying and printing machines. This invention is "*Alissoff's Mechanical Printer*," of Russian origin, for which

* It may be here mentioned that for the last few years the *Colonial Office* have dispensed altogether with the use of the letter-books, and have thus been enabled to effect a considerable saving in clerical labour. We are informed that the draft of the letter, which is kept with the papers, has been found to answer satisfactorily for purposes of reference and record, and that no practical inconvenience has been experienced in consequence of the abandonment of the old system.

Mr. C. Kleberg, of 21, Lime Street, acts as Agent in London. It is a development of the *Type-Writer* described above, though worked on a different principle, and contains as many as 240 characters, that is to say, two styles of capitals, two of small letters, and, for each style, suitable figures and signs of punctuation. It is not as rapid or simple in its working as the *Type-Writer*, and, therefore, apparently not so well suited for ordinary Departmental use. But in addition to the proofs having as perfect an appearance as those obtained from ordinary type, it has the advantage of the ink used being black, and serving for the transfer of the copy to lithographic stone or to a zinc plate. If the number of copies required to be reproduced is not in excess of 300, the cost by this process is estimated to be half the cost by printing, while the result is nearly identical, and arrived at with greater expedition.

The machine, therefore, would seemingly lend itself to setting up and producing copies of memoranda, circulars, and such like; though, not being experts, we do not wish to speak authoritatively on the suitableness of this machine for use in the public service.

Seeing, however, that the cost of the machine is calculated to be but little more than 30*l.*,* we think it well worth consideration whether one should not be obtained on hire by the Stationery Office, and worked there for a time, in order to test its working powers, and to see how far they are adapted for Departmental business.

* The manufacture not being as yet established, the price of the machine is not definitely fixed.

II.

Printing.

We now come to the question of Departmental *printing*, to which our attention was likewise directed by the Treasury Minute of January 22, 1877.

Its superiority over other devices.

Notwithstanding the saving of manual labour which we think may be effected by the introduction into Public Departments of the mechanical contrivances recommended by us for ordinary and daily official use, printing must necessarily be the main process, as a rule, for multiplying copies. It has the advantage of being an old, and therefore a highly perfected art. The facility with which it is read and is referred to, the proof that it will stand against age and light, the small space into which it admits of written matter being compressed,—all necessarily bring out its superiority over other devices.

Inconvenience attending its use.

Considerable inconvenience and delay, however, have been experienced by Public Departments in getting printed work done through the medium of the Stationery Office, from the fact that the premises of the firms of printers who have contracts with the Government are not situated in the immediate vicinity of the principal Public Offices. There is little doubt that complaints made under the present system are sometimes unreasonable; and that the requirements of Public Departments could be more punctually met, were a little more foresight exercised on the part of officials.

How Departmental presses came to be established.

But, in the most favourable circumstances, a certain amount of delay is frequently unavoidable; and in order to facilitate despatch and to

provide for the secret printing of confidential papers, there have, as your Lordships are aware, been established in some few offices Departmental presses.

The presses which are worked by Messrs. Harrison at the Foreign Office and War Office, and of which the expenses are included in the Stationery Office Vote (Class II, Vote 25), have a varying, and at all times, considerable staff attached to them.* The presses at the Science and Art Department and at the Admiralty are of smaller extent, and the cost of them, exclusive of paper, is borne on the respective Votes of these Departments.†

* 1. Amount paid to Messrs. Harrison for work done at the *Foreign Office Press*, for the year ending December 31 ,1876, 10,296*l.* 17*s.* 8*d.*, viz.:—

	£	s.	d.	£	s.	d.
For the *Foreign Office*—						
Bulletins, State Papers	334	14	8			
Passports	89	2	0			
Parliamentary	2,945	1	3			
Confidential	4,577	7	3			
				7,946	5	2
For the *Colonial Office*—						
Confidential	702	17	1			
Parliamentary	1,176	9	6			
				1,879	6	7
For the *Treasury*—						
Confidential				332	11	3
For the *Privy Council*—						
Confidential				138	14	8
				£10,296	17	8

2. Amount paid to Messrs. Harrison for work done at the *War Office Press*, for the year ending December 31, 1876, 2,166*l.* 1*s.* 7*d.*

† 1. Expense of *Admiralty Press* borne on Navy Estimates 1877–78, Vote 3:—

	£	s.	d.
Printer (2*l.* 2*s.* 0*d.*) a-week	109	4	0
Allowance for assistance	140	0	0
	£249	4	0

2. Expense of *Press* at *Science and Art Department* borne on Civil Service Estimates 1877–8, Class IV, Vote 2, Subhead E2:—

Printers, 2*d.* to 1*s.* an hour £620 0 0

Separate presses are an undoubted convenience to the Departments possessing them. They are exclusively at the command of the officers of those Departments for confidential as well as urgent work. The Clerks are able to communicate their instructions verbally to the Superintendent of the printers, and without trouble to have personal access to the rooms in which the work of printing is being carried on.

The convenience of them.

On the other hand, several objections, with some of which your Lordships are already familiar, have been made to these separate presses.

Objections to them.

(1.) It is urged that, as the printer at the Departmental press takes his orders directly from the Departmental Officers, there is no opportunity given for any initial control on the part of the Stationery Office, either as regards the description of type and paper used, or the space which the printed matter should occupy. There is necessarily no uniformity of procedure, to ensure that a sufficient check is enforced with reference either to the number of copies ordered to be printed, or to the correct delivery of the number charged for by the printer, or to the proper execution of the work.

No control over the work.

Papers too frequently made *confidential*.

(2.) There is a natural tendency to call papers confidential, many of which are not so in any greater sense than are all official papers; and, as these separate presses are intended primarily for *confidential* and urgent work, and as confidential printing is paid for at a considerably higher rate* than ordinary printing, a direct premium is placed on the adoption of the more expensive class of work, in order to ensure the use of the press on the premises.

Temptation to "make work."

(3.) When, in times of no great pressure, it is known that there is in the same building a staff of printers, whose hands may not be fully employed, it is not unnatural that Heads of Departments, in order to justify the retention of the press, should be tempted to give orders to have papers and memoranda set up in type, which there is no real necessity to print.

Proofs too much and too often corrected.

(4.) When proofs are so easily obtainable as they are from Departmental presses, there is not the same amount of care taken in preparing the manuscript in the first instance. The consequence is, that corrections innumerable are made, and the alterations involve constantly as much trouble and expense as the setting up of the type in the first instance, and sometimes even more.

Objections may be obviated and facilities extended.

What we have, then, to consider is, how these objections to separate Departmental presses may be obviated; and how at the same time the facilities which they undoubtedly afford to the Departments in possession of them can be maintained, and likewise be extended to all other public offices.

—by establishment of a Central Press.

This object, we think, would best be attained by the establishment of a Central Printing Press in the vicinity of the majority of public offices, to which all Departments would have direct access for their confidential and urgent work, and for so much other work as the press would be capable of turning out.

Advantages of such an arrangement.

We have no doubt that such a press would be found of immense convenience. It would secure much greater despatch as regards all work now passed on to the printer by the Stationery Office; it would give uniformity to the work executed for the different Departments; and it would tend generally to remove causes of complaints. An arrangement of this kind would likewise lend itself far more easily to proper and efficient control than presses of different sizes scattered about in public offices, varying in discipline and procedure; and it is obvious that a concentration would lead to a considerable saving of labour and plant, to say nothing of its admitting of the introduction of steam-machinery, which is not applicable to presses on a small scale.

Favourable opportunity of setting up a Press in Stationery Office.

Owing to certain changes recently made in the contracts with printing firms, by which they will find their own paper, the demands on the storage-room in the Stationery Office buildings are considerably lessened.

* The payment of this higher rate, which is 20 per cent. above the ordinary rate, is under existing arrangements confined to Messrs. Harrison (if Messrs. Eyre and Spottiswoode, who receive an extra 5 per cent. for *India Office* printing, be excepted).

In future, however, as a temporary arrangement, the contracts with certain Government printers in London will include a general charge of 8 or 9 per cent. for *confidential* work.

These demands are capable of being still further reduced, if arrangements were made whereby the stores required for the Indian Government were procured and sent out straight from the contractors to India, or to the India Office Stores in Lambeth, instead of being sent first to the Stationery Office.* There would, therefore, be no difficulty in finding room for a press of considerable size and the necessary plant, and in accommodating a sufficient staff of printers, within the building of the Stationery Office itself and under the direct supervision of the Comptroller. We recommend that the present favourable opportunity should be taken of establishing such a press there, which would have the further advantage of securing the printing of the " London Gazette " in the same building, in which it is now managed. We presume that, on an estimate being formed of the requirements of the Public Departments regarding confidential and urgent printing, the work would be put up to tender; but the arrangement of the details would probably be best left to the Comptroller of the Stationery Office.

Discontinuance of Departmental Presses recommended.

If this proposal be adopted by your Lordships, we think that the necessity for retaining separate departmental presses would no longer exist, and we recommend that those at the Admiralty, War Office, and Science and Art Department should then be discontinued. We do not include in this recommendation the Foreign Office press (to the management of which, under its present Superintendent, successive Secretaries of State have borne high testimony), because we consider that there are special reasons, in connection with the nature of the work of that Department, which may be held to justify its retention. We think, however, that on the creation of a central printing establishment, other offices which at present send their confidential or urgent work to the Foreign Office press should no longer be allowed to do so.

With the exception of that at the Foreign Office.

* A specific recommendation about the removal of the India Office stores hardly lies within the province of the Committee. It has, therefore, only been referred to indirectly in connection with securing accommodation at the Stationery Office; but it may be stated that the change would effect a considerable saving for the *Indian Government*, as may be estimated from the following figures:—

Average sum received by Stationery Office as commission on supplies furnished to India £4,300

	£
On taking the supplies into their own hands, the India Office would probably be put to an additional expense of about	1,000
The saving, therefore, which would result to the Indian Government would be	3,300
	£4,300
The Stationery Office expenditure might probably be reduced by about	£600
On the other hand, the extra receipts of the *Stationery Office* would fall on an average by	3,700
	£4,300

The loss, however, to the Imperial Exchequer, which would result in the event of this change being effected, is of course entirely independent of, and cannot be taken into account with, the financial effect of the proposals in this Report.

Saving to be effected.

It would hardly be possible to estimate beforehand what would be the exact financial effect of this proposal. We think, however, that it cannot but lead to a saving of public money if there be taken into consideration the free accommodation which the Government would be in a position to offer to the printers, in addition to the economy which must inevitably result from concentration, as well as improved supervision.

Inventions for type-setting.

In the course of our inquiries, we have had brought to our notice two inventions for hastening the process of type-setting, that of Dr. Mackie (of 11, St. Bride Street, E.C.), and that used in the "Times" office. We have also seen another most ingenious machine, which is now being shown at the Caxton Exhibition, and which sets up type by means of electricity. These inventions apparently open out great prospects of improvement both in economy and speed. As, however, we do not think that the Government should be their own printers, but that they should have their printing done under contract by persons in the trade, the matter is rather for the consideration of the printer than for the Government.

Restriction on confidential printing.

In conclusion, we would advocate some greater restrictions on the amount of *confidential* printing, for which a much higher price is charged than for ordinary printing. We have already expressed our conviction that the use of the word "confidential" in connection with printing is not unfrequently abused; and in order to put some check upon this, we recommend that the rule, now partially enforced, should be made general, viz., that unless a special certificate is given by the Head of a Department that the matter is *confidential*, it should be printed in the ordinary way and at the ordinary rates.

(Signed) ROW. WINN.
ALGERNON WEST.
R. H. MEADE.
R. G. C. HAMILTON.
C. W. MERRIFIELD.

(Signed) E. W. HAMILTON,
Secretary.

30*th July*, 1877.